**Stage 2 Physics ASSESSMENT TYPE 1: Investigations Folio**

**Science as a Human Endeavour Investigation**

**Summary of Task**

Your task is to explore a recent or near future development in computer hardware or equipment that has the potential to change how we use electronic devices. (e.g. wireless changing, quantum computers, biometric sensors, projection keyboards etc. ) You will then present a scientific report about it.

The hardware that is the focus ***needs*** to be a direct application of physics concepts from Stage 2 Physics. You will show how it demonstrates the interaction between science and society based on at least one of the key concepts of science as a human endeavour. You will also consider what you think will be its impact on society. Appropriate referencing is expected.

**Description of assessment**

*Your scientific communication* can be in any of the following formats:

|  |  |  |
| --- | --- | --- |
| * Written report * Oral presentation | * Informative video * Pod cast | * An article for a scientific publication * Any other form that meets the approval of your teacher. |

The length of the task is a maximum of 1500 words if written, or a maximum of 9 minutes for an oral presentation, or the equivalent in multimodal form.

It should include:

**Introduction** that *briefly* outlines

* the piece of hardware that is the focus,
* the Science as a Human Endeavour key concept(s) being explored

**Physics involved**

* + Detailed explanation of the Physics underpinning the hardware.

**Link between science and society**

* Explanation of how this hardware (or the development of it) illustrates the interaction between science and society. Your explanation needs to explicitly address one or more of the ‘key concepts of science as a human endeavour’ dot points, found on the next page.
* Discussion of the purpose, potential impact, or application of the focus of the investigation, e.g. further development, effect on quality of life, environmental implications, economic impact, intrinsic interest

Your discussion *may* consider:

* + What will be the cost to society?
  + On what scale will the impact be?
  + Will it be positive or negative for society?
  + Would it have an environmental impact?
  + Have an impact on our health and wellbeing?
  + An economic impact?

**Conclusion**

* Briefly outline the potential impact on society.

An appropriate **Reference list**

**Assessment conditions**

This is an individual task that is to be completed within 2 weeks. It is to be submitted electronically through….

The following is the due dates for this investigation: (Note that the teacher will provide written feedback of the information that you provide in your outline)

|  |  |  |
| --- | --- | --- |
| **Topic and SHE component/s explored** | **Written outline of task** | **Final report** |
| Two days after commencing task | 1 week after commencing | 2 weeks after commencing |

**Key concepts of Science as a Human Endeavour**

|  |
| --- |
| **Communication and Collaboration**   * Science is a global enterprise that relies on clear communication, international conventions, and review and verification of results. * Collaboration between scientists, governments and other agencies is often required in scientific research and enterprise.   **Development**   * Development of complex scientific models and/or theories often requires a wide range of evidence from many sources and across disciplines. * New technologies improve the efficiency of scientific procedures and data collection and analysis. This can reveal new evidence that may modify or replace models, theories, and processes.   **Influence**   * Advances in scientific understanding in one field can influence and be influenced by other areas of science, technology, engineering, and mathematics. * The acceptance and use of scientific knowledge can be influenced by social, economic, cultural, and ethical considerations.   **Application and Limitation**   * Scientific knowledge, understanding, and inquiry can enable scientists to develop solutions, make discoveries, design action for sustainability, evaluate economic, social, and environmental impacts, offer valid explanations, and make reliable predictions. * The use of scientific knowledge may have beneficial or unexpected consequences; this requires monitoring, assessment, and evaluation of risk, and provides opportunities for innovation. * Science informs public debate and is in turn influenced by public debate; at times, there may be complex, unanticipated variables or insufficient data that may limit possible conclusions. |

Performance Standards for Stage 2 Physics

| - | Investigation, Analysis and Evaluation | Knowledge and Application |
| --- | --- | --- |
| A | Critically deconstructs a problem and designs a logical and coherent physics investigation with detailed justification.  Obtains, records, and represents data, using appropriate conventions and formats accurately and highly effectively.  Systematically analyses and interprets data and evidence to formulate logical conclusions with detailed justification.  Critically and logically evaluates procedures and their effect on data. | Demonstrates deep and broad knowledge and understanding of a range of physics concepts.  Applies physics concepts highly effectively in new and familiar contexts.  Critically explores and understands in depth the interaction between science and society.  Communicates knowledge and understanding of physics coherently, with highly effective use of appropriate terms, conventions, and representations. |
| B | Logically deconstructs a problem and designs a well-considered and clear physics investigation with reasonable justification.  Obtains, records, and represents data, using appropriate conventions and formats mostly accurately and effectively.  Logically analyses and interprets data and evidence to formulate suitable conclusions with reasonable justification.  Logically evaluates procedures and their effect on data. | Demonstrates some depth and breadth of knowledge and understanding of a range of physics concepts.  Applies physics concepts mostly effectively in new and familiar contexts.  Logically explores and understands in some depth the interaction between science and society.  Communicates knowledge and understanding of physics mostly coherently, with effective use of appropriate terms, conventions, and representations. |
| C | Deconstructs a problem and designs a considered and generally clear physics investigation with some justification.  Obtains, records, and represents data, using generally appropriate conventions and formats, with some errors but generally accurately and effectively.  Undertakes some analysis and interpretation of data and evidence to formulate generally appropriate conclusions with some justification.  Evaluates procedures and some of their effect on data. | Demonstrates knowledge and understanding of a general range of physics concepts.  Applies physics concepts generally effectively in new or familiar contexts.  Explores and understands aspects of the interaction between science and society.  Communicates knowledge and understanding of physics generally effectively, using some appropriate terms, conventions, and representations. |
| D | Prepares a basic deconstruction of a problem and an outline of a physics investigation.  Obtains, records, and represents data, using conventions and formats inconsistently, with occasional accuracy and effectiveness.  Describes data and undertakes some basic interpretation to formulate a basic conclusion.  Attempts to evaluate procedures or suggest an effect on data. | Demonstrates some basic knowledge and partial understanding of physics concepts.  Applies some physics concepts in familiar contexts.  Partially explores and recognises aspects of the interaction between science and society.  Communicates basic physics information, using some appropriate terms, conventions, and/or representations. |
| E | Attempts a simple deconstruction of a problem and a procedure for a physics investigation.  Attempts to record and represent some data, with limited accuracy or effectiveness.  Attempts to describe results and/or interpret data to formulate a basic conclusion.  Acknowledges that procedures affect data. | Demonstrates limited recognition and awareness of physics concepts.  Attempts to apply physics concepts in familiar contexts.  Attempts to explore and identify an aspect of the interaction between science and society.  Attempts to communicate information about physics. |